14

A NOTE ON BROKEN SU(3) SYMMETRY

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The $J^P = 3/2^+$ baryon decuplet decay into a baryon and a pseudoscalar meson octet has been studied using the U-spin technique within the framework of broken $SU(3)$. The relevant Hamiltonian transforms like the $I = 0$, $Y = 0$ member of a unitary octet, thus conserving isospin I and hypercharge Y. For the processes considered the decay amplitudes obtained by using the Wigner-Eckart theorem occur in terms of three parameters. The novel feature of our treatment is the estimation of the ratio of two of them from the observed decuplet mass splittings. This is essentially a dynamical assumption. A second relation between the parameters is obtained from the experimental decay widths Γ.*

The results are tabulated below :

Process	Theoretical		Expt.	Reference
	SU(3)	Broken SU(3)		
$\Gamma(N^{*-} \to \pi^- n)/\Gamma(Y_1^{*-} \to \Lambda\pi^-)$	2.4	2	~ 2	Rosenfeld *et al.* R.M.P. *36*, 977 (1964)
$\Gamma(\Xi^{*-} \to \Xi\pi)/\Gamma(Y_1^{*-} \to \Lambda\pi^-)$	0.5	0.09	0.13 ± 0.05	
$\Gamma(Y_1^{*-} \to \Sigma\pi)/\Gamma(Y_1^{*-} \to \Lambda\pi^-)$	$\sim 16\%$	$\sim 0\%$*	$2 \pm 2\%$	

*We have taken $\Gamma(Y_1^{*-} \to \Sigma\pi \approx 0)$

Note that the type of borken $SU(3)$ considered accommodates the puzzling Y_1^{*-}(1385) branching ratio.

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